

Intel® Software Guard Extensions SDK for Linux* OS Release Notes

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Revision: 2.3 Open Source (version: 2.3.100.46354)

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1 Introduction

Intel provides the Intel® Software Guard Extensions (Intel® SGX) SDK, a software isolation technology, to help you protect your applications.

This document provides system requirements, installation instructions, limitations, and legal information.

Product Contents

Intel® Software Guard Extensions SDK package includes:

- An Intel® Software Guard Extensions SDK installer for Linux* OS. It includes binaries to develop enclave applications. The main components include:
 - Trusted libraries including standard C library, C++ runtime Added support, C++ STL, and others
 - Development tools including edger8r, signing tool, and others
 - Sample projects.

2 What's New

Intel® Software Guard Extensions SDK includes the following changes in version 2.3:

- Added support for Ubuntu* 18.04 LTS 64-bit Desktop and Server version

- Provided a new set of the SGX common loader APIs in `sgx_enclave_common.h`
- Provided the sample code for Switchless Call
- Provided a new API in `tcrypto`: `sgx_ecc256_calculate_pub_from_priv`
- Changed the `sgx_create_enclave` API: the function ignores the parameter of a launch token and will not update it after the function successfully returns
- Fixed bugs.

Changes in Previous Releases

Intel® Software Guard Extensions SDK includes the following changes in version 2.2:

- Added support for Switchless, a new mode of operation to perform calls from/to SGX enclaves
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 2.1.3:

- Updated the cryptography library to Intel® Integrated Performance Primitives Cryptography 2018 Update 2.1. Mitigated security vulnerability CVE-2018-3617 (<https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2018-3617>). For more details, refer to Security Advisory INTEL-SA-00106 (<https://security-center.intel.com/advisory.aspx?intelid=INTEL-SA00106&languageid=en-fr>) and INTEL-SA-00135 (<https://security-center.intel.com/advisory.aspx?intelid=INTEL-SA00135&languageid=en-fr>)
- Provided enhancements to the Intel® SGX Cryptographic library
- Added support for Intel® SGX Protected Code Loader (Intel® SGX PCL). It is intended to protect Intellectual Property (IP) within the code for Intel® SGX enclave applications
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 2.1.2:

- Mitigated security vulnerability CVE-2018-3626 (<https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2018-3626>). For more details, refer to Security Advisory INTEL-SA-00117 (<https://security-center.intel.com/advisory.aspx?intelid=INTEL-SA-00117&languageid=en-fr>)

Intel® Software Guard Extensions SDK includes the following changes in version 2.1.1:

- Updated security to the Intel® SGX SDK
- Added new `sgx_register_wl_cert_chain` API that allows the Intel® SGX application to register an enclave
- Added support for CentOS* 7.4
- Added support for SUSE* Linux Enterprise Server 12
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 2.0:

- Added support for the Intel® SGX Enclave Dynamic Memory Management (EDMM) to dynamically manage enclave memory: dynamic heap expansion, dynamic stack expansion, dynamic thread creation, and page attribute modification
- Added support for Red Hat* Enterprise Linux* Server 7.4
- Added support for Safe String APIs of the C library in an enclave
- Added an option to build the Intel® SGX SDK using the Intel® SGX SSL crypto library instead of the Intel® IPP Cryptography open source version
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 1.9.100.39124:

- Added C++11 Added support

To improve support for C++11 on the Linux* OS, the Linux* SDK 1.9 includes a new trusted C++ library based on libcxx (see <http://llvm.org/svn/llvm-project/libcxx/trunk>). Note that the Standard C++ Library based on STLPort (`sgx_tstdcxx`) will be deprecated in the next release.

- Added support for Protected File System – a basic subset of the regular ‘C’ file API for Intel® SGX enclaves that provides files with both confidentiality and integrity protection
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 1.8.100.37689:

- Added support for the TCMalloc library

- Added support for new Linux* distributions. See Software Requirements for details
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 1.7.100.36470:

- Updated the cryptography for Intel® Integrated Performance Primitives (Intel® IPP) library to version 9.0 Update 4
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes in version 1.6.100.34478:

- Added new `setjmp/longjmp` APIs in the trusted C library
- Fixed bugs.

Intel® Software Guard Extensions SDK includes the following changes before version 1.5.100.32783:

- Added support for profiling Intel® SGX applications using the Intel® VTune™ Amplifier. To profile Intel® SGX applications, use the VTune™ Amplifier 2016 Update 2, the “Intel SGX Hotspots” analysis type.
- Added the Intel® SGX Eclipse* plug-in to create Intel® SGX enclave projects
- Added support for implicit Thread Local Storage (TLS)
- Added support for nested HW exception in a trusted environment

3 System Requirements

Software Requirements

- Supported Linux* OS distributions:
 - Ubuntu* 16.04 LTS 64-bit Desktop and Server version
 - Ubuntu* 18.04 LTS 64-bit Desktop and Server version
 - Red Hat* Enterprise Linux* Server 7.4 (for x86_64)
 - CentOS* 7.5 (for x86_64)

- SUSE* Enterprise Server 12 (for x86_64)
- Fedora* 27 Server version

NOTE: It is highly recommended to use the listed Linux* OS distributions. Other distributions have not been tested.

4 Known Issues and Limitations

- Intel® SGX for Linux* OS does not support setting a different charset in GNU* Project Debugger (GDB*).
- Building the Intel® SGX SDK sample project “RemoteAttestation” is possible only within the Intel® SGX SDK installation folder.
- Intel® SGX does not support the “long long” type in C++ templates.
- `sgx-gdb` depends on GDB* 7.9.1 or later versions. Please upgrade GDB* if its version is lower than 7.9.1.

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